

REMARKS

Claims 1-26 are pending in the application. Claims 1-26 stand rejected under 35 U.S.C. 102(e) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over U.S. Patent No. 6,492,443 to Kudemura et. al. For the reasons set forth below, reconsideration of the application is respectfully requested.

Claims Rejections – 35 USC§’s 102(e) and 103

Claim 1 has been amended. Basis for amended claim 1 may be found in previous claims 5, 6, 7, and 8 in conjunction with the disclosure in the second paragraph on page 6 of the specification.

Claim 27 has been added. This additional claim is based on amended claim 1 together with the further limitation in claim 9 (see also page 6 of the specification).

The objections raised in the Official Action are very brief and simply to the effect that all of the original claims are either anticipated or rendered obvious by US 6,492,443 to Kudemura et. al.

However Kudemura et al. do not disclose compositions as defined in amended claim 1 or the newly added independent claim. Essentially Kudemura et al. disclose a polymer composition which comprises a norbornene polymer and a thermosetting resin (column 3, lines 1-6). The thermosetting resins disclosed by Kudemura et al. are not examples of the polymeric diluents which “are co-curable with the polynorbornene” as now required by the independent claims.

Kudemura et al. do propose additional components for his formulation including cross-linking agents (column 16, lines 16 *et seq*), cross-linking aids (column 17, lines 16 *et seq*), particulate fillers (column 17, lines 50 *et seq*) and flame retardants (column 18, lines 16 *et seq*). The further incorporation of these additional components required by Kudemura et al. increases the complexity of the resulting compositions and their processing and once again the examples of these components given by Kudemura et al. do not fall within the definition of the polymeric diluent in the independent claims of the application.

To the extent that Kudemura et al. disclose the use of a plasticizer, (column 20, line 28) no distinction is made between the selection of a monomeric plasticizer or a polymeric plasticizer. The advantage of a polymeric diluent capable of functioning as a plasticizer is described at paragraph 0027 of the current application:

[0027] The polymeric diluent may be any polymer which is able to plasticise the polynorbornene in the cured composition. As the diluent is polymeric there are no problems caused by migration thereof within the composition (as would occur with a monomeric plasticiser). Such migration could affect the bonding of the substrate to the circuit board.

The crosslinking referred to by Kodemura et al. near the bottom of column 13 follows a discussion of the various thermosetting resins which are typically epoxy compounds and a hardener. None of the various thermosetting resins appear to have the capability of co-curing with a polynorborne component. Further, in view of the location of this discussion, and because of the nature of the cross-linking agents discussed it seems likely that Kodemura et al. envision a cross-linking of the thermosetting resin rather than the polynorborne portion of the composition. If this is the case, the polynorbornene composition would not contain a component that could co-cure with the polynorbornene component.

As disclosed at column 19, lines 9 *et seq* the Kodemura et al. formulations may incorporate "other polymer components". However Kodemura et al. do not, in this section, disclose the EPDM elastomers to which the independent claims now refer. Moreover Kodemura et al. does not emphasize the feature of having one of his "other polymer components" having an alkylene group so as to be co-curable with the polynorbornene.

Finally, paragraphs 0020 and 0021 describe unexpected processing advantages provided by Applicant's claimed compositions containing Applicant's polymeric diluent compared to the prior art compounds of the type taught by Kodemura et al.

[0020] Polynorbornene has a low dielectric constant that does not vary significantly over a large temperature range and also exhibits a low dielectric loss. Both of these properties would ordinarily make the material suitable for use as a substrate in an electronic circuit. However, due to the physical properties of the polynorbornene it has not previously been found possible to produce it in the required form (usually "sheet-like") for an electronic circuit substrate due to difficulties associated with processing.

[0021] What we have found is that an admixture of polynorbornene and a polymeric diluent may be cured to produce a composition that reflects the excellent properties of the polynorbornene yet still allows itself to be readily processed into, for example, a form that is suitable for the substrate of an electronic circuit. Indeed the curable composition has been found to be extrudable into sheet form. The use of extrusion in forming sheets allows the

production of circuit boards in a continuous rather than a batch fashion, as it is possible to extrude the composition, e.g. using a sheet extruder. This is in contrast to the processing procedure that has been employed with compositions of the prior art (such as described in GB-A-2 204 588) which required the substrate to be formed in batch fashion using moulds.

In contrast to Applicant's claimed invention, Kodemura et al. teach a norbornene polymer composition suitable for forming moldings, prepgs, laminates and films (column 1, lines 6-13) and provide no teaching of how to make a norbornene polymer that can be extruded or otherwise readily processed.

In view of the above amendments and remarks, it is submitted that the currently pending claims 1-4 and 9-27 are not anticipated by Kodemura et al., nor are the pending claims obvious in view of Kodemura et al. and that the present application is now in condition for allowance. The Examiner is requested to pass the case to issue. If the Examiner should have any comments or suggestions to help speed the prosecution of this application, the Examiner is requested to contact the undersigned representative by telephone.

Respectfully submitted,

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